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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,719	08/28/2003	Kenji Nakajima	Q77115	6178

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EXAMINER	
LAM, ANN Y	

ART UNIT	PAPER NUMBER
1641	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/649,719	NAKAJIMA, KENJI	
	Examiner	Art Unit	
	ANN Y. LAM	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,15,16,18 and 19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,15,16,18 and 19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-4, 15, 16 and 19 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 10/692,011, in view of Decker et al., 4,230,683. Application No. 10/692,011 recites the limitations substantially as claimed (see claims 1-9), except for the receptor being labeled with an enzyme, nor that the enzyme is part of an enzyme-labeled antibody wherein the enzyme-labeled antibody is subjected to

specific binding with the labeled receptor. Decker et al. however teach this specific type of assay.

Decker et al. teach an improvement in an immunoassay comprising the steps of reacting an antigen bound to a solid support with a hapten/conjugated antibody to the antigen, further reacting hapten conjugated antibody bound to the solid support with labeled anti-hapten antibody and determining the labeled antibody bound to the solid support (col. 1, lines 59-64). Decker et al. teach that the invention makes use of hapten conjugated antibodies to amplify antigenicity of the bound antibody. Each hapten conjugated antibody will have several hapten molecules bound thereto providing for multiplication of the antigenic reactivity (col. 2, lines 59-63). Moreover, Decker et al. teach that methods for directly or indirectly binding antigens or antibodies to be detected to a solid support are well known (col. 1, lines 7-11, and lines 38-40). Decker et al. also teach that the use of labeled antibodies (i.e., labeled with enzymes for example) in solid phase immunoassay is well known (col. 2, lines 43-45).

As to claim 19, Applicant claims in the present application that the liquid containing the labeled receptor is caused to flow across the adsorptive regions at a different time from when the enzyme-labeled antibody is caused to flow across the adsorptive regions. While Decker et al. disclose the reagents mentioned above and performing the assay by allowing the reagents to react respectively with each other, there is no specific disclosure of flowing the two liquids mentioned above at different times. However, it is predictable by the skilled artisan that the reagents mentioned above may be flowed at different times, as such flowing will also allow for the reactions

to occur and thus the assay to be performed. Such predictability renders the steps obvious.

It would have been obvious to one ordinary skill in the art at the time the invention was made to perform the Decker et al. immunoassay using the invention claimed by Application No. 10/692,011 because Decker et al. teach that the immunoassay as disclosed, including use of hapten/conjugated antibody, provides an improvement of the immunoassay because it amplifies the antigenic reactivity of the immunoassay. One of ordinary skill in the art would be motivated to utilize the improved immunoassay as the particular assay performed using the method recited in Application No. 10/692,011 for its amplified detection, as would be desirable for more accurate results.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1, 3, 15, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hudak et al., 20030186463, in view of Yager et al. 7,258,837, and

further in view of Decker et al., 4,230,683, and Rubenstein et al., 3,875,011, and in light of Patel et al., 5,260,222

As to claims 1, 3, and 18, Hudak et al. teach a test strip that can be practiced in conjunction with any form of chemical, biochemical or biological reaction which is wholly or partially amenable to being performed on a chromatographic strip. It is particularly advantageously combined with assays for one member of a natural biological binding pair in blood samples. Such binding pairs may include ligand-antiligand pairs, antibody-antigen pairs, antigen-receptor pairs and any other such pairs described in the literature. Such assays may be of the so-called "sandwich" type or the competitive type and may be designed to utilize any known type of labelling agent, including colorimetric dyes, enzymes to which fluorescent, luminescent or chromogenic agents reactive therewith are added in the final detection step and other tags known in the art. See paragraph 0024.

The chromatographic strip may have multiple zones comprised of different materials or, it may have as little as one zone depending upon the operations to be carried out on the sample. Depending also, upon the operations to be carried out on the strip, it per se or at least one of its zones may be paper, and especially a specialty paper designed to have capillary interstices through which various liquids including those containing entrained solids, can flow. Other suitable materials besides paper that may form a part, such as one or more zones, or all of a chromatographic strip useful with the invention include other materials well known in the art for their ability to be conducive to lateral flow of liquids, including liquids bearing finely divided particulate

matter, through their capillary interstices including cellulose derivatives such as nitrocellulose or a cellulose ester, synthetic resins such as nylon, polyester, polyamide, especially in fibrous forms thereof, glass, especially glass fiber, or any of the variety of other materials known in the art for use in chromatography or immunochromatography operations. The chromatographic strip may be so chosen that it is adapted to permit bibulous lateral flow, or it may have been treated to render non-bibulous the lateral flow that passes through its capillary interstices. See paragraph 0025.

The test strip may have capture lines, each comprising a different immobilized antibody. See paragraph 0033.

The absorbent test strip is equivalent to a biochemical analysis unit comprising a plurality of porous adsorptive regions to which receptors or ligands are bound (i.e., at the multiple capture lines.)

While Hudak et al. disclose that molecules, e.g., antibodies, are immobilized at the capture lines, Hudak et al. do not disclose specific means for applying the capture molecules, such as spotting.

However, spotting capture reagents onto a test strip as a means for applying the reagents is a well known technique in the art. Yager et al. disclose that it is known in the art to detect multiple analytes by providing detection zones on a surface with different capture molecules and that suuch arrays may be formed by spotting, ink-jet printing or lithographic printing. Thus, the spotting the capture reagents in the Hudak et al. invention would have been obvious to the skilled artisan as such a method of applying a reagent is well known in the art.

Moreover, Hudak et al. disclose that the chromatographic test strip can be any material that allows for lateral flow of liquids through capillary interstices. Such flow is by capillary force, as evidenced by Patel et al. An assay is disclosed by Patel et al using a bibulous material bound to a support or solid surface. The absorbent pad may be any hydrophilic bibulous material such as paper, sponge, felt, porous polymers and the like, and can be in any shape provided that there is at least one direction of traversal of a liquid test solution or reagent by capillary migration. See column 6, lines 1-20, and column 11, lines 50-65. Movement of fluid is by capillary flow through a bibulous material until the bibulous material can no longer transport liquid by capillary or capillary flow ceases when the liquid is exhausted. See column 11, line 66 to col. 12, line 23. Thus, flow of liquid through the capillary interstices in the Hudak et al. invention is by capillary action, as shown by Patel et al., and capillary action is a type of *forcible* flowing and in the case of capillary action within a porous material, it is also a forcible flowing *into* the porous material.

Also, while Hudak et al. disclose that the test strip can be practiced in conjunction with any form of chemical, biochemical or biological reaction which is wholly or partially amenable to being performed on a chromatographic strip, and gives examples of sandwich type formats and assayis using labeling agents such as enzymes reactive with fluorescent or luminescent or chromogenic agents (see paragraph 0024), Hudak et al. do not disclose the specific assay claimed by Applicant. However, such an assay would have been obvious to the skilled artisan, as shown by Decker et al. in view of Rubenstein et al..

Decker et al. teach an improvement in an immunoassay comprising the steps of reacting an antigen bound to a solid support with a hapten/conjugated antibody to the antigen, further reacting hapten conjugated antibody bound to the solid support with labeled anti-hapten antibody and determining the labeled antibody bound to the solid support (col. 1, lines 59-64). Decker et al. teach that the invention makes use of hapten conjugated antibodies to amplify antigenicity of the bound antibody. Each hapten conjugated antibody will have several hapten molecules bound thereto providing for multiplication of the antigenic reactivity (col. 2, lines 59-63). Moreover, Decker et al. teach that methods for directly or indirectly binding antigens or antibodies to be detected to a solid support are well known (col. 1, lines 7-11, and lines 38-40). Decker et al. also teach that the use of labeled antibodies (i.e., labeled with enzymes for example) in solid phase immunoassay is well known (col. 2, lines 43-45).

The hapten/conjugated antibody is equivalent to the claimed labeled receptor. The labeled antihapten antibody is equivalent to the claimed labeled antibody. Decker et al. teach in column 1, lines 49-53 that enzymes [labels] such as catalase, peroxidase .beta.-glucouronidase, glucose-6-phosphate dyhydrogenase, urease, and glucoseoxidase are conveniently linked to antibodies by art recognized techniques such as that in patent number 3,875,011 [to Rubenstein et al.] While Decker et al. do not actually disclose that a substrate is added for reaction with the enzyme for its detection, this is disclosed in the patent to Rubenstein et al. in column 21, lines 46-60. Thus, use of the enzyme substrate as is well known in the art, and as shown by Rubenstein et al., would have been obvious to the skilled artisan in order to detect the enzyme label.

It is emphasized that in using the chromatographic strip of Patel et al. to perform the assay discussed above, the reagents, including the reaction liquid containing the enzyme label is forcibly caused to flow across each of the porous adsorptive regions of the strip, via capillary action.

Likewise, as to claim 3, the labeled receptor is also forcibly caused to flow across each of the porous adsorptive regions, via capillary action.

And similarly regarding claim 15, the reaction liquid containing the labeled receptor or the labeled ligand (as disclosed by Decker et al. as described above) is forced to flow into an interior of each of the porous adsorptive regions, via capillary action.

As to claim 19, Applicant claims that the liquid containing the labeled receptor is caused to flow across the adsorptive regions at a different time from when the enzyme-labeled antibody is caused to flow across the adsorptive regions. While Decker et al. disclose the reagents mentioned above and performing the assay by allowing the reagents to react respectively with each other, there is no specific disclosure of flowing the two liquids mentioned above at different times. However, it is predictable by the skilled artisan that the reagents mentioned above may be flowed at different times, as such flowing will also allow for the reactions to occur and thus the assay to be performed. Such predictability renders the steps obvious.

Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hudak et al., 20030186463, in view of Yager et al. 7258837, and Decker et al., 4,230,683, and Rubenstein et al., 3,875,011, as applied to claims 1 and 3 above, and further in view of Patel et al., 5,260,222.

As to claims 2 and 4, Hudak et al. do not disclose ceasing flow of the liquid containing enzyme-labeled antibody for a period longer than which it was forcibly caused to flow. However, Hudak et al. do teach that by allowing the blood sample and such reactants as may flow with it into the capture zone to flow into the capture zone and reside there for whatever period may be needed to allow completion of the intended endpoint reaction, one can then clear the capture zone by immersing the strip in chase solution to clear the capture zone of debris and excess reactants. See paragraph 0038.

Moreover, Patel et al. disclose that movement of fluid is by capillary flow through a bibulous material until the bibulous material can no longer transport liquid by capillary or capillary flow ceases when the liquid is exhausted. See column 11, line 66 to col. 12, line 23.

It would have been obvious to the skilled artisan in performing the assay as discussed above regarding claims 1 and 3, to allow the bibulous material disclosed by Hudak et al. (paragraph 0025) to no longer transport the reagents by capillary flow due to saturation or the liquid being exhausted as disclosed by Patel et al., and to further allow for the ceasing of flow to be longer than the period for which it flowed since the skilled artisan would recognize that this allows for the reaction to complete, which is desirable as disclosed by Hudak et al. Moreover, it has been held that where the

general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (MPEP 2144.05 IIA, citing *In re Aller*, 1-5 USPQ 233.) In this case, stopping the flow of enzyme-labeled antibody for a period of time longer than the period of time during which the reaction liquid containing the enzyme-labeled antibody has been forcibly caused to flow appears to be an optimum or workable range and thus, its discovery involves only routine skill in the art.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hudak et al., 20030186463, in view of Yager et al. 7258837, and Decker et al., 4,230,683, and Rubenstein et al., 3,875,011, and in light of Patel et al., 5,260,222, as applied to claim 3 above, and further in view of Shipwash, 6,846,638.

As noted earlier, the labeled receptor is disclosed by Decker et al., the label being disclosed in general as those well known in the art, for example enzymes and fluorescent chemicals, (see col. 2, lines 43-45; and see also col. 1 lines 49-52). As to claim 16, Applicant recites that the method further comprises photoelectrically detecting the bound labeled receptor, which is not disclosed by Decker et al.

However, Shipwash disclose that labels for use in the invention include enzymes that produce luminescent or electrogenic products (col. 60, lines 6-21), and that the labels will be detected in a manner appropriate to their nature, and optical detection methods including CCD cameras are commonly employed for detection (col. 32, lines

49-57). It would have been obvious to one of ordinary skill in the art to utilize an enzyme label that produces luminescent or electrogenic products as the enzyme label in the Decker et al. method, because Decker et al. do not limit the label to any particular label but rather disclose that enzyme labels well known in the art may be used, and Shipwash disclose that such known enzyme labels are those that produce luminescent or electrogenic products. Moreover, the skilled artisan would utilize the CCD camera for detection, as taught by Shipwash, because Shipwash teaches that the labels will be detected in a manner appropriate to their nature and the skilled artisan would recognize that the luminescent product of the enzyme label is detectable by a CCD camera. (It is noted that Applicant's specification disclose that a CCD camera is utilize for photoelectrically detecting.)

Response to Arguments

Applicant has amended the claims to place the application in condition for allowance according to the previous Office action. However, upon reconsideration, Examiner finds that the claims are not allowable over the prior art for the reasons set forth above. Specifically, as discussed above, the capillary flow of fluids in the porous test strip of the prior art is a forcible flow *across* the porous chromatographic strip as well as *into* the porous chromatographic strip.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on Mon.-Fri. 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ann Y. Lam/

Primary Examiner, Art Unit 1641